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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/820,409	04/08/2004	Gregory J. May	200312860-1	7814

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HEWLETT PACKARD COMPANY  
P O BOX 272400, 3404 E. HARMONY ROAD  
INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER
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WOLLSCHLAGER, JEFFREY MICHAEL

ART UNIT	PAPER NUMBER
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1732

MAIL DATE	DELIVERY MODE
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06/19/2007

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

**Office Action Summary**

Application No.

10/820,409

Applicant(s)

MAY, GREGORY J.

Examiner

Jeff Wollschlager

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1732

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 March 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,4-10 and 26-29 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,4-10 and 26-29 is/are rejected.
- 7) ☒ Claim(s) 1 and 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Response to Amendment***

Applicant's amendment to the claims filed March 19, 2007 has been entered. Claim 1 is currently amended. Claims 26-29 are new. Claims 2, 3, and 11-25 were previously canceled. Claims 1, 4-10 and 26-29 are pending and under examination.

### ***Claim Objections***

Claims 1 and 29 are objected to because of the following informalities: the amendment to claim 1 and new claim 29 refer to the "three-dimensional structure". The recitation should be "three-dimensional object" to avoid any confusion between the object and the identifiable structure within the object. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 103***

Claims 1 and 4-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van der Zel (WO 02/085241) in view of Jagmin (U.S. 5,044,955).

Regarding claim 1, Van der Zel teaches a method for producing an artificial tooth wherein he employs ink-jet printheads to apply iterative layers of ceramic and binder (page 26, line 33-page 27, line 21; Abstract; page 8, lines 21-33; page 9, line 37-page 10, line 2; page 16, line 19-page 17, line 18). The binder solution contains pigments and the composition of the materials can be changed at each print point to allow components with varied composition and microstructures to be produced wherein the completed design is executed with a computer aided manufacturing process (page 10, lines 33-37) and wherein the powder that does not have binder added to it remains to support the layers that will be printed above (page 28, line 9-page

29, line 4). Van der Zel does not expressly teach the pigment or the microstructures form an identifiable structure that can be detected using a non-invasive dimensional imaging device.

However, Jagmin teaches a method of providing a radiographically readable personal information code within a tooth (Abstract; Figure 1A, Figures 2-4; col. 4, lines 11-14; col. 5, lines 31-38).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to form radiopaque identifiable structures, such as those disclosed by Jagmin as part of the microstructures taught by Van der Zel for the purpose, as taught by Jagmin of creating an identifiable structure which is not plainly visible while improving the ability to identify missing persons, for example (Abstract), or for providing a means to identify the lot, batch, and serial number of the artificial tooth.

As to claims 4-6, Jagmin (Figure 1 and Figure 2; col. 4, line 11-41) teaches a plurality of identifiable structures are formed and that the identifiable structures are fabricated from either the broadly defined build materials or contrast enhancing materials.

As to claim 7, Jagmin teaches the identifiable structure forms a combination of a contrast enhancing material and a gap to form a letter (Figure 1 and 2), bar code characters, or binary code characters (col. 5, lines 31-38).

As to claim 8, the identifiable structure disclosed by Jagmin is visible to an x-ray device (col. 2, lines 55-66)

As to claim 9, Van der Zel employs pigmented binders (page 9, line 37-page 10, line 2) and microparticles of ceramic ink (page 27, line 21-page 28, line 9). Additionally, Jagmin teaches the color of the radiolucent material is selected to match the tooth (col. 2, line 65-col. 3, line 1).

As to claim 10, Jagmin teaches the identifiable structure is a letter, bar code, characters, or binary code characters (col. 5, lines 31-38).

Claim 26 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van der Zel (WO 02/085241) in view of Jagmin (U.S. 5,044,955), as applied to claims 1 and 4-10 above, and further in view of Zhong (US 6,676,987).

As to claim 26, Van der Zel teach that the ink compositions can be changed at each print point allowing components with varied composition and microstructure (page 28, lines 19-22) and further teaches a build-up of multiple layers (page 31, lines 5-11). Jagmin discloses employment of radiographic materials and that the radiographic materials are visible by X-ray. Van der Zel do not teach multiple contrast enhancing materials or that the materials may be seen with various imaging devices.

However, Zhong teaches a method of printing radiographic materials to form identification codes in medical devices located within an individual and discloses that the radiographic material can be seen by a variety of non-invasive techniques such as radiography and MRI (col. 5, lines 38-col. 6, line 7).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have employed multiple detectable compositions in the method disclosed by Van der Zel for the purpose of providing multiple forms of distinct information, such as a code for identifying the person as suggested by Jagmin and a code to identify the product as suggested by Zhong.

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Claims 27 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Van der Zel (WO 02/085241) in view of Jagmin (U.S. 5,044,955), as applied to claims 1 and 4-10 above, and further in view of Berman (US 5,071,503).

As to claims 27 and 28, the combined prior art teaches the method as set forth above. Van der Zel further teaches curing the layers of material (page 17, lines 19-21). Van der Zel does not teach planing the layers of material. However, Berman teaches a layered manufacturing method of making three-dimensional objects (col. 1, lines 6-37) wherein the well known process of removing/planing excess material from the layers is employed (col. 1, lines 41-55 and col. 2, lines 37-49).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Van der Zel and to have planed the layers of material as taught by Berman for the purpose, as suggested by Berman, of maintaining the high precision shape of the layered object.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Van der Zel (WO 02/085241) in view of Jagmin (U.S. 5,044,955), as applied to claims 1 and 4-10 above, and further in view of Cawley et al. (US 5,779,833).

As to claim 29, the combined prior art teaches the method as set forth above to form an artificial tooth/dental implant. Van der Zel does not teach the three dimensional object is a bone replacement. However, Cawley et al. teach an analogous layered manufacturing method (Abstract) wherein they disclose that such a method is suitable for producing a dental implant or a replacement bone (col. 11, line 60-col. 12, line 2).

Therefore it would have been *prima facie* obvious to one having ordinary skill in the art at the time of the claimed invention to have modified the method of Van der Zel of producing an

artificial tooth and to have produced a replacement bone since Cawley et al. teach that layered manufacturing techniques are suitable for making both dental implants and bone replacements. One having ordinary skill would have been motivated to expand the range of commercial products, as is routinely practiced in the art.

### ***Response to Arguments***

Applicant's arguments filed March 19, 2007 with respect to the section 102 rejection over Ross (US 5,830,529) have been considered but are moot in view of the amendment to the claims.

Applicant's arguments filed March 19, 2007, with respect to the section 103 rejection have been fully considered, but they are not persuasive.

#### **Applicant's arguments appear to be on the following grounds:**

1. Van der Zel and Jagmin are not analogous art.
2. Van der Zel does not describe an identifiable structure and Jagmin does not mention freeform fabrication.
3. One skilled in the art would have to completely change the teaching of Van der Zel to accommodate the changes in view of Jagmin or vice versa. One having ordinary skill would not have been led to combine the relevant teachings of the references.

#### **The arguments are not persuasive for the following reason:**

1. Van der Zel is directed to a method of producing an artificial tooth and discloses that components with varied composition and microstructures can be made (page 28, line 9 – page 29, line 4). Jagmin is directed to a method of forming a readable code in a tooth. Both Van der Zel and Jagmin are in the same field of endeavor, dentistry, and even more specifically deal with shaping and forming teeth. The examiner maintains that Van der Zel and Jagmin are analogous art and further notes that amended claim 1 recites "a dental structure".

2. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

3. The examiner notes that Van der Zel teaches that the "[i]nk composition can be changed at each print point allowing components with varied composition and microstructure to be produced with excellent resolution" (page 28, lines 19-22). Jagmin discloses forming radiographic readable codes in teeth with radiographic colored materials. The examiner maintains that one having ordinary skill in the art would have been motivated to modify the teaching of Van der Zel and to have formed radiographic readable codes as a varied composition and microstructure within the artificial tooth formed by Van der Zel as is substantially presented in the rejection above.

### ***Conclusion***

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,



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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeff Wollschlager whose telephone number is 571-272-8937. The examiner can normally be reached on Monday - Thursday 7:00 - 4:45, alternating Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JW

Jeff Wollschlager  
Examiner  
Art Unit 1732

June 12, 2007

  
CHRISTINA JOHNSON  
SUPERVISORY PATENT EXAMINER

6/13/07